

# ALICE ITS geometry import completion

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July 26, 2016

## We import only the staves

The idea is to import the staves for each layer into the sPHENIX simulation setup, and position them by specifying:

- Layer radius
- Number of staves per layer (implies  $\phi$  angle step)
  - If the radius changes, use the same **arc step** as in the ITS
- Stave tilt (my guess for now)

# Tilt angle

The tilt angle used for the **inner barrel** is 0.25 radians (from eye-balling the display - we need to find out what tilt ALICE is planning to use).

- The tilt angle for layers 3-6 is zero at present, but if you look carefully at the display, some tilt may be better.

# Code location

I have essentially completed the set up of the code needed to implement the ALICE ITS staves in sPHENIX simulations. The code is in:

[https://github.com/adfrawley/coresoftware/tree/ITS\\_MAPS\\_development/](https://github.com/adfrawley/coresoftware/tree/ITS_MAPS_development/)

The macros to run it are at:

[https://github.com/adfrawley/macros/tree/ITS\\_MAPS\\_development/macros/g4simulations](https://github.com/adfrawley/macros/tree/ITS_MAPS_development/macros/g4simulations)

# Code changes

## The new code:

PHG4MapsSubsystem

PHG4MapsDetector

PHG4MapsSteppingAction

PHG4CylinderGeom\_MAPS

PHG4CylinderCell\_MAPS

PHG4MapsCellReco

## Code that has been updated:

PHG4SvtxDigitizer

PHG4SvtxDeadArea

PHG4SvtxThresholds

PHG4SvtxClusterizer

PHG4HoughTransform

## Code that still needs to be updated:

SVtxEvaluator

# Macros

[https://github.com/adfrawley/macros/tree/ITS\\_MAPS\\_development/macros/g4simulations](https://github.com/adfrawley/macros/tree/ITS_MAPS_development/macros/g4simulations)

The appropriate switches are set in:

Fun4All\_G4\_sPHENIX.C

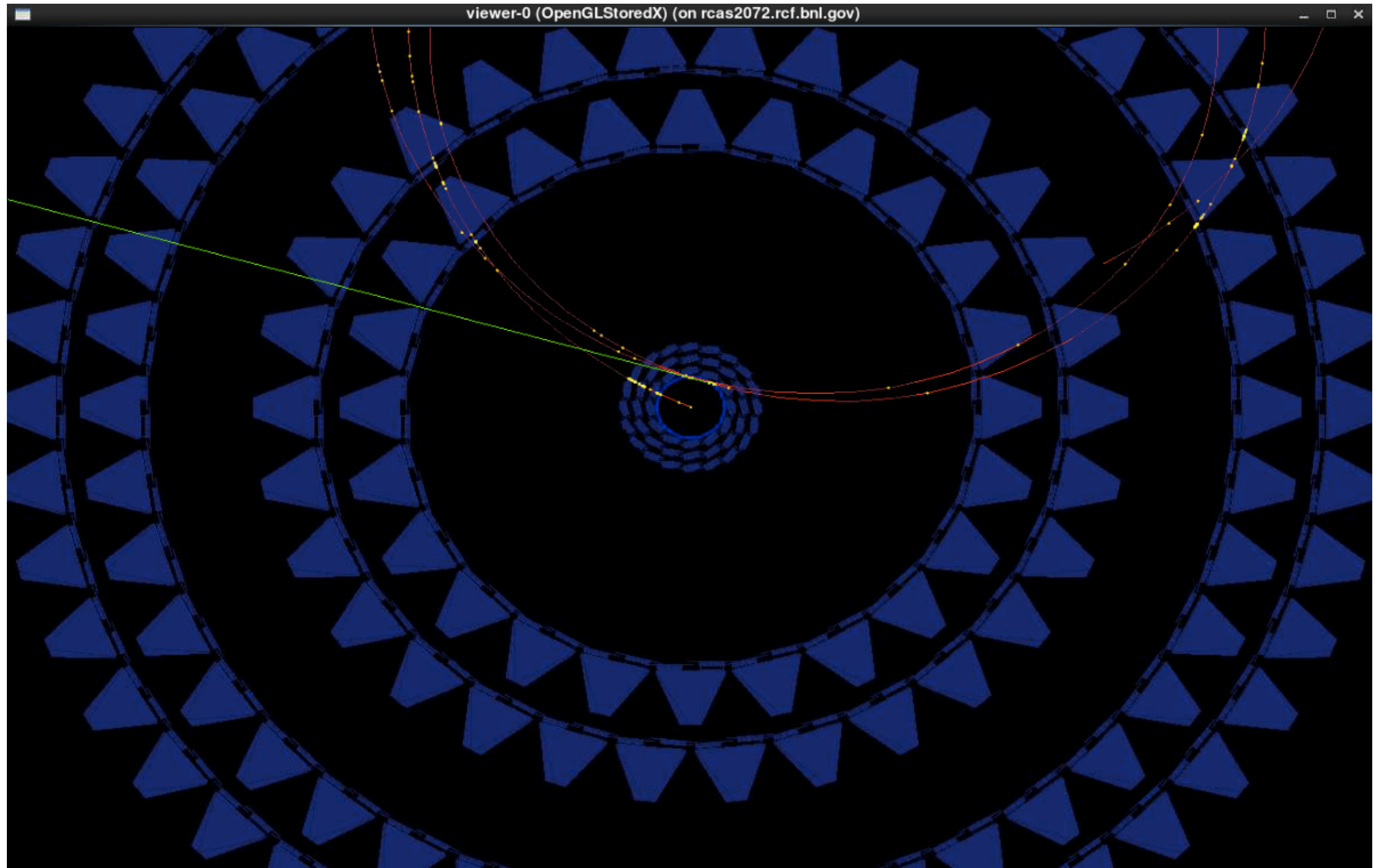
The setup of the ladders is done by:

G4\_ITS\_MAPS.C

The stave geometries are found in:

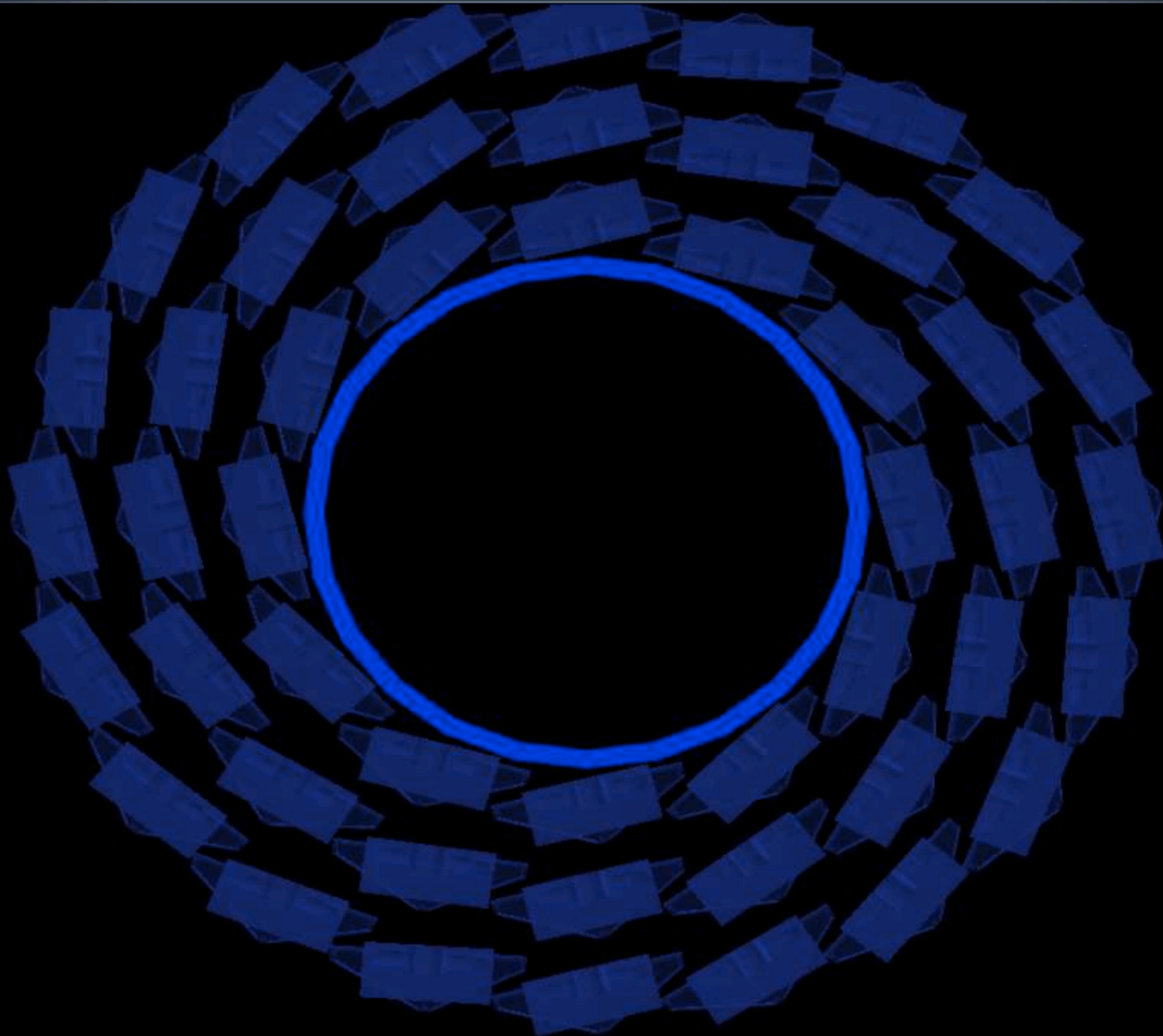
ITS.gdml

# The ALICE ITS staves in sPHENIX

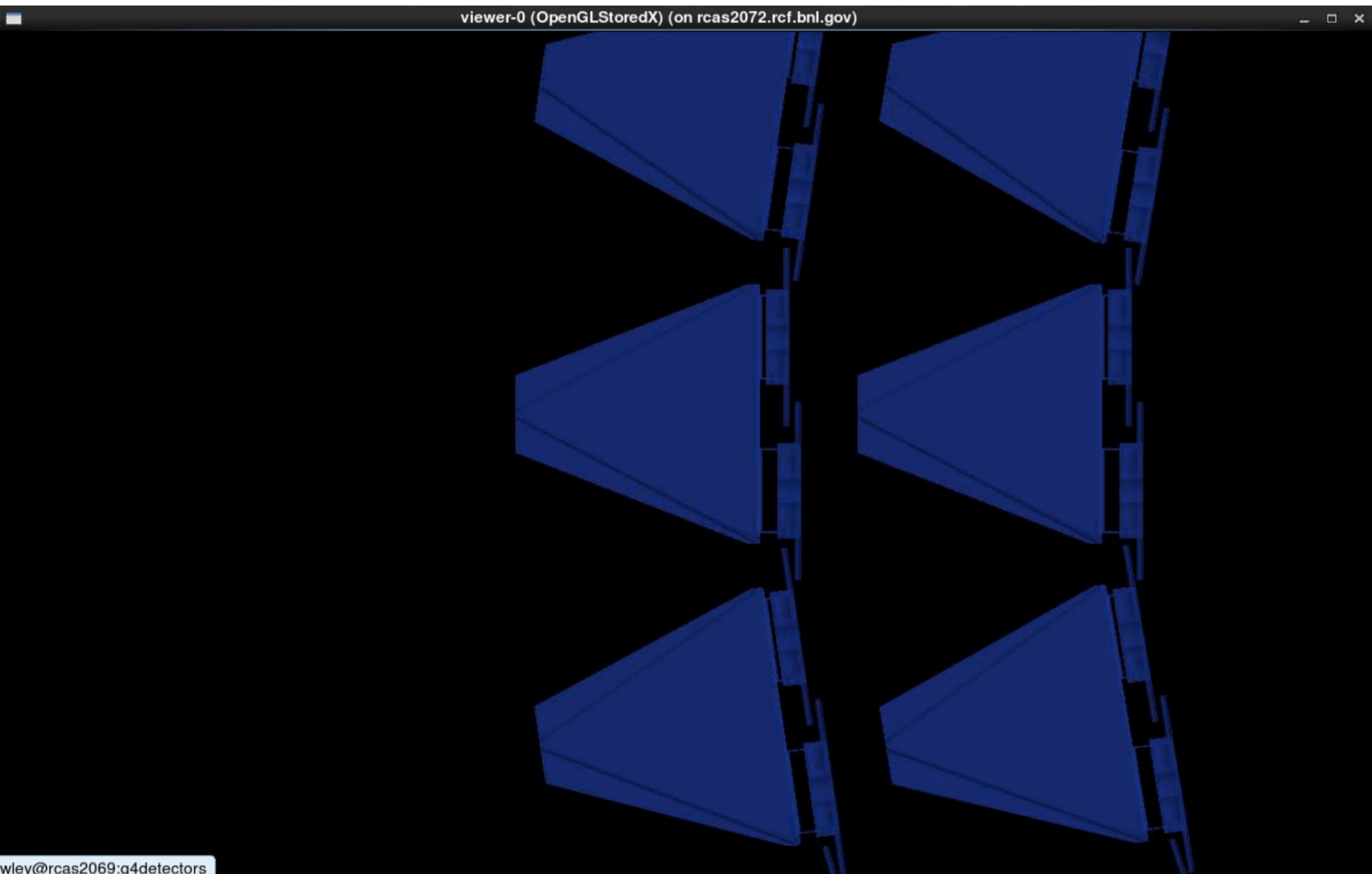


# The ALICE ITS staves in sPHENIX

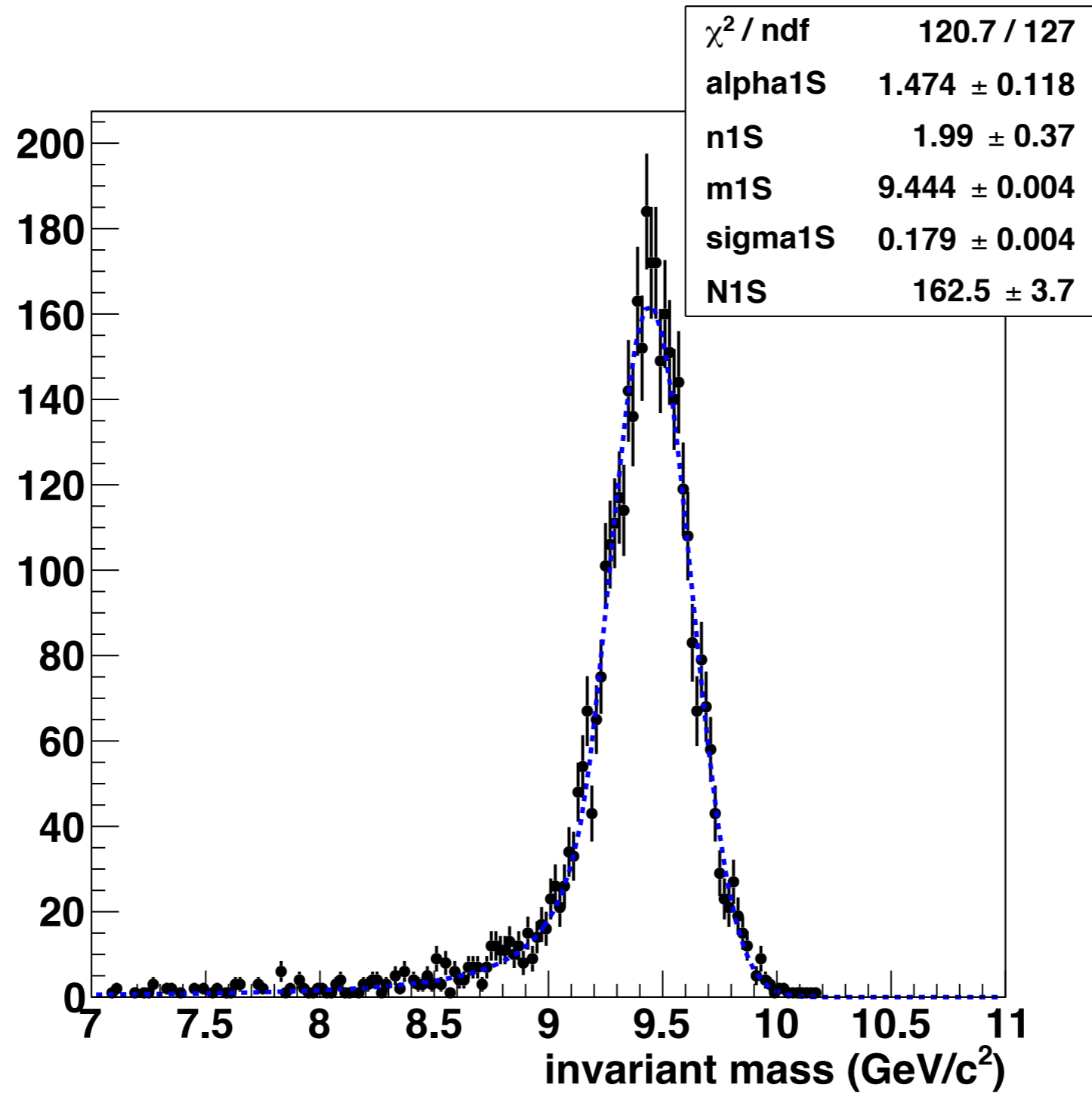
viewer-0 (OpenGLStoredX) (on rcas2072.rcf.bnl.gov)



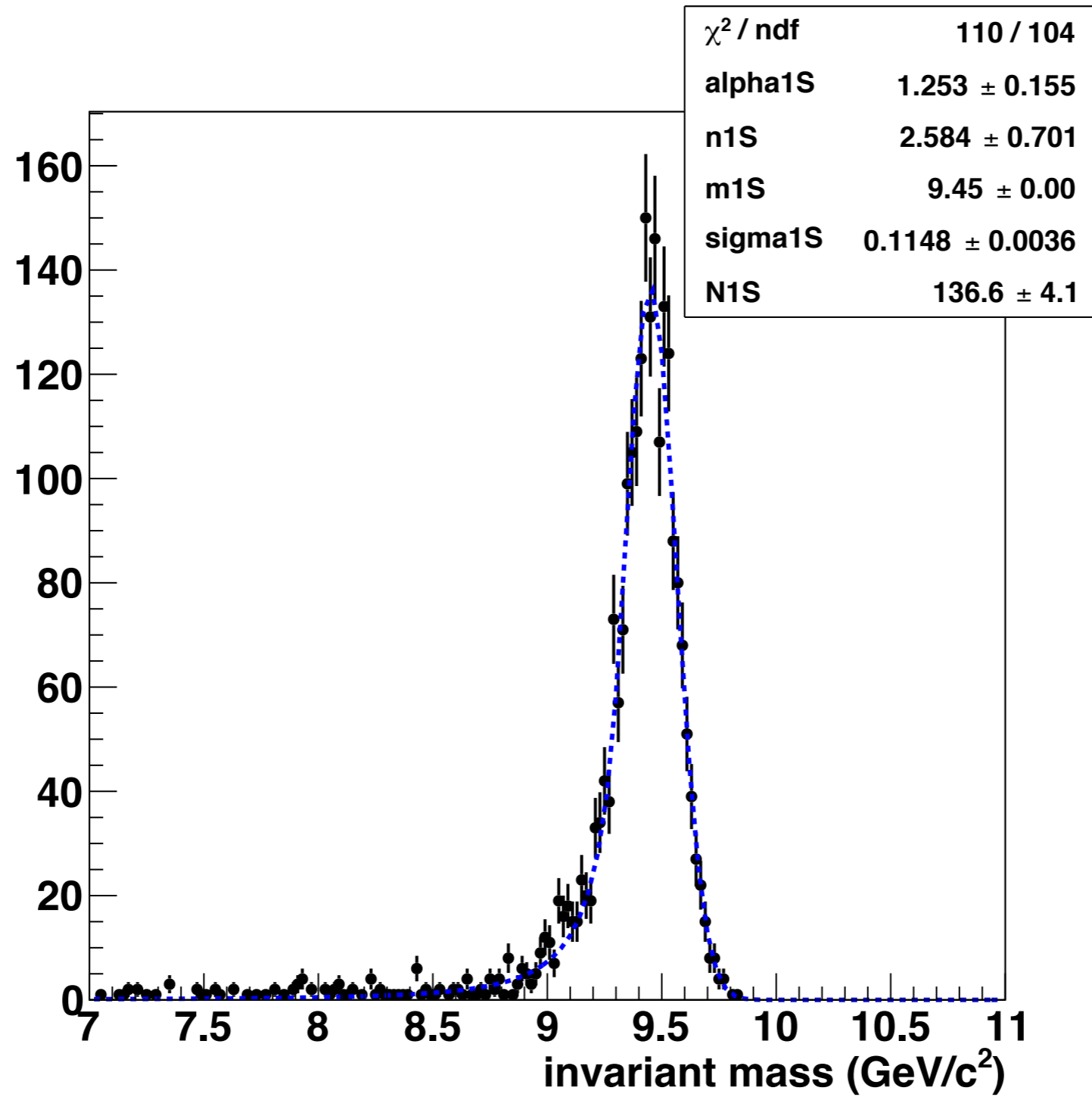
# The ALICE ITS staves in sPHENIX



# Mass spectrum with existing tracker - ITS geometry



# Mass spectrum with existing tracker - move outer layer to 64 cm



# What remains to be done?

`SVtxEvaluator` needs work. At present the truth information is not being found at all. I need to look at the code and see where the disconnect is.

With the existing tracker, the efficiency is lower when I do the `sharing` of energy between hit cells properly (as in `PHG4CylinderCellReco`), instead of putting all of the energy into one hit cell (which is an option for checking). I just realized this. I need to look to see if the code for sharing energy has a bug.